

Nutrition 101



An introduction to the basics of sports nutrition.

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Introduction

This document aims to introduce you to basic nutrients and concepts common in sports nutrition. By reading this through you will understand some of the key principles that Trailblazer Nutrition utilizes in order to help you achieve your potential.

Some things worth remembering are the following:

- Sports nutrition is not exactly the same as healthy eating. Optimal nutrition for sports performance generally involves sugar during exercise and carbohydrates surrounding exercise. These recommendations are related to performance rather than health, and healthy diet may look different to what is recommended.
- In this plan you will see that sugar is not discouraged immediately either side of exercise either. Processed, packaged carbohydrates are undeniably convenient and effective for endurance athletes with little time, however I would not recommend these foods for someone seeking optimal health. If you have the time and motivation, then 'whole foods' are definitely the best option.
- Sports nutrition tends to focus a little more on nutrient quantities and timing than nutrition for health. When I give healthy eating advice, I ask people to 'focus on food, not nutrients'. However, to ensure that you are getting the most out of your training sessions, it is important to provide enough nutrients, so we need to be a bit more diligent when looking at what the foods provide in terms of nutrition.

In this plan I have given both healthy and convenient options so you have the choice between health, convenience, and practicality whilst maintaining performance. Obviously embarking on an endurance journey like you have done is a very healthy thing to do. Combining endurance exercise, healthy everyday eating, psychological challenges and a bit of sugar to fuel it all will be an amazing physical and mental journey, so I am stoked to be a part of it.

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Key Nutrients

Carbohydrates

If your body is a car, carbohydrates are the petrol - they are our best fuel for exercise.



Carbohydrates can be split into two broad categories; sugars vs starchy carbohydrates. Quick burning sugars are used for immediate sources of energy during exercise and are great at quickly providing carbohydrates for recovery. They are refined, low in fibre, and provide little in the way of other nutrients making them good during exercise, but less healthy as everyday foods.

Slow burning carbs are starchy, wholegrain foods. They provide background energy which becomes available more slowly but lasts much longer than sugary fuel sources. Use these foods in your main meals to provide long lasting energy all day. Real foods are the best, but packaged options such as muesli bars can be a convenient option on occasion.



Sugary carbohydrates	Starchy carbohydrates
Lollies Biscuits Sugary drinks Sports gels Baking White bread and jam/honey	Wholemeal bread Starchy vegetables (e.g. potato, kumara) Brown rice and pasta Unrefined, wholegrain cereals Beans and lentils Grains such as rice, quinoa, couscous

Click [here](http://trailblazernutrition.co.nz/nutrition-101/carbomymates/) for more details or visit <http://trailblazernutrition.co.nz/nutrition-101/carbomymates/>

Protein

Protein is used to repair and build muscles, the cars framework if you like. Your body does not rest from this task, so it is important to consume protein regularly throughout the day.



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Even if you have a large training volume you can meet your protein requirements from food sources rather than using expensive protein supplements.

Sources of protein

- dairy (milk, yoghurt, cheese)
- eggs
- nuts and seeds
- lentils and legumes
- meat
- tofu
- beans, chickpeas (please note these also contain carbohydrates)



Fat/oils

Fat's role in the diet can be hugely varied for each individual and personalised advice is necessary. Fat often comes with the same food as protein and as a basic rule we want to minimise animal fat (saturated fats) except for fish (which are unsaturated fats) and increase the amount that we get from plant sources (nuts, seeds, lentils, avocados, olives). Oils such as olive oil, canola oil, coconut oil, margarine etc, are 'fats' and thus contain a lot of energy even though they are considered healthy fats.

Do not be afraid of healthy fats, they can be a great way of boosting caloric intake during heavy training weeks and providing your body with a range of vitamins and minerals.

Sources of healthy fat

- Nuts and seeds
- Olive oil
- Avocado
- Fish
- Lentils, legumes

Fat is somewhat in vogue as an energy source for endurance exercise (instead of carbohydrates). This is a complex concept and Tom can give expert advice on following a low carbohydrate high fat diet if you choose this route.

Water

Water plays an extremely important role in our body, including a vital role in temperature regulation (we lose water in our sweat so we need to replace it as we exercise). Hydration has been somewhat hijacked by the bottled water industry - it is not that complicated, just drink regularly throughout the day, and more when you have been training.

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Fruits and Veggies

If we stick with the car analogy, fruits and veggies are the oil that makes everything work. We can provide our bodies with the best fuel possible, but if we don't oil our engine with plenty of fruit and veggies every day, then we won't operate optimally, adapt to our training programme, and we are more likely to get sick.

Fruit and veggies are protective against many chronic diseases and fruit can also be a good source of high quality carbs.

Key Micronutrients

As long as you have a healthy diet containing a variety of fruits and vegetables, proteins, healthy fats, and carbohydrates, it is very unlikely that you will be deficient in any micronutrients.

However, it has been shown that people undergoing endurance training can often be deficient in iron, vitamin d and calcium through restrictive dietary habits.

If you have a healthy diet and do not have any clinical issues, you should not have a problem with any other electrolytes.

I have outlined some key concepts around these nutrients. First of all though I will talk about sodium (salt) as this is a nutrient that causes some confusion amongst endurance athletes.

Sodium/salt

Sodium (we get it from table salt and packaged foods, usually as sodium chloride) plays a role in exercise and hydration. It is actually very likely that sodium's role in exercise hydration has been overhyped in order to sell more sports drinks however. We actually get plenty of salt from our food, so you don't need to be adding it at every opportunity as an endurance athlete. Evidence suggests that salt can help rehydration after exercise, but you can get this from food, not just electrolyte drinks.

Within the sports drinks market, sodium and "electrolytes" have been riding on the coattails of carbohydrate. Aside from making drinks palatable, they play a negligible role in sports performance. It is my strong recommendation that you do not bother with electrolyte drinks alone during exercise, and you ensure that your drink contains carbohydrates, as it is carbohydrates that improve performance rather than the electrolytes.

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In fact, we can confidently say that electrolyte drinks do not play any role whatsoever in the prevention of cramps during exercise. Relying on electrolyte drinks to prevent cramps can actually be harmful as it will draw your attention away from techniques that might actually work. In saying this, if you swear by any method to prevent cramps, be it salt, magnesium, or another nutrient, continue to use it; just because science says one thing, if it works for you, then that is great.

Iron

Iron is a key nutrient for the transport of oxygen to our working muscles, and is therefore extremely important to endurance athletes.

While most people meet their iron requirements easily, it is worth noting that people doing endurance exercise have higher requirements than the general population. Vegetarians, vegans, adolescent athletes, athletes who restrict their energy intake, and menstruating women (particularly those with heavy periods) all should pay attention to their diet with regards to iron.



Vitamin c (found in fruits and veggies) helps the absorption of iron from our gut, and tea and coffee inhibit the absorption of iron. Include fruit/veggies with your iron rich meals, and avoid tea/coffee at these times.

Iron containing foods	Foods that aid iron absorption	Foods that inhibit iron absorption
Red meat (beef, lamb, pork)	Green leafy vegetables	Coffee
Almonds and cashews	Fruit	Tea
Chicken	Esp kiwifruit	
Iron fortified cereals	Esp oranges	

Vitamin d

The sunshine vitamin. This incredibly important vitamin has been shown to be a key nutrient in a remarkable number of metabolic processes. It is synthesised in our skin when we are exposed to sunlight.

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Unfortunately vitamin D is present in small quantities in only a small amount of foods (oily fish, liver, eggs, and some fortified dairy products). It is widely accepted that it is very difficult to meet vitamin d requirements through diet alone.

It has been shown that some endurance athletes are deficient in vitamin D, and this can lead to negative long term health consequences, and possibly negatively impact performance in the short term.

To improve your vitamin d status it is recommended that you expose a large area of your skin (arms, legs, back) to the sun for a short period of time, about 5-10 minutes. This is better than exposing a smaller area for longer periods (and getting sun burnt). During summer months try to do this before 10am or after 4pm.

Try to choose foods higher in vitamin D regularly, and if you are concerned that you are deficient, consult your GP.

Calcium

We all know that calcium is important, and you probably know that calcium is found mainly in dairy products. Women need 2 - 3 serves of calcium containing products every day, and men need 2. Do you think that you currently do that?

Good ways to get extra calcium in your diet are by:

- Use calcium fortified milk on your breakfast cereal
- Have a low sugar (unsweetened/greek) yoghurt as a snack, or use it as a dip/sauce
- Use milk as a recovery drink after exercise
- Use cheese in sandwiches
- Add milk to hot drinks
- Add extra green leafy veges to your meals
- Use beans in your cooking
- Snack on almonds or sesame seeds, add them to salads, cereal, and smoothies.

The Three Pillars of Sports Nutrition

Endurance nutrition is more than just sports drink and gels on race day. Your performance on event day is affected by what you eat everyday, and every training session from the moment that you start training. If you use the power of nutrition from the start of your training you will:

- Optimise fitness gains from training
- Prevent illness and injury
- Develop a higher tolerance for consuming carbohydrates during exercise
- Master your race day nutrition plan prior to the event
- Be able to use nutrition strategies on race day to achieve your potential

Sports nutrition has 3 key pillars:

- **Everyday nutrition**
- **Exercise specific nutrition - nutrition for training and event day**
- **Nutrition for recovery**

Everyday nutrition

Your everyday diet must supply your body with enough nutrients for it to perform its everyday tasks as well as fuelling training and recovery. If you eat into this critical nutrient reserve to fuel your training, you will get sick, not adapt to your training programme, and risk long term injury and sickness.

Healthy eating is obviously a massive topic in itself, but the below themes are key aspects to a healthy diet. Following these general guidelines on a day to day basis will ensure that you provide your body with the best environment to adapt and respond to the challenges of your training programme. Restrictive diets which do not provide enough calories are often low in key performance and health nutrients.

Eat real food

- Have at least 5 handful size serves of fruit and vegetables everyday, and even more during heavy training weeks.
- Have fresh, unprocessed food as much as possible. Most of your food should be coming from the perimeter of the supermarket (fruit and veggies, unprocessed meats, and dairy) rather

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than from the aisle where you will find packaged foods which have been subjected to a manufacturing process (adding unnecessary sugar, salt or fat, plus additives and preservatives).

- Have 2-3 serves of dairy or dairy alternatives each day.
- Choose a range of different carbohydrates such as whole grain breads and cereals, rice, wholemeal pasta, and potatoes. Choose grainy, unrefined carbohydrates where possible.
- As a general rule, avoid refined carbohydrates such as white breads and cereals, baking, lollies, soft drink, and other sugary foods. However these foods can be used sparingly to provide a quick sugar hit during or immediately after exercise.
- Consume protein at each meal, and if you snack, try to include protein in your snacks.
- Incorporate vegetarian protein into your meals (lentils, legumes, beans, tofu, nuts and seeds).
- Follow the plate model: that is each meal must have a serve of protein, carbohydrates, and lots of veggies or a piece of fruit.

Drink water to thirst

- Don't hydrate obsessively, just drink to thirst - keep a drink bottle handy but don't stress about drinking a certain amount each day.
- If your chosen drink is not tap water, it's probably high in sugar, do you need these extra calories? Plastic bottles are terrible for our planet.
- If you find that you are peeing lots and it is clear but you are still thirsty, you may not be having enough sodium.
- If you choose to drink alcohol be aware that it promotes fluid loss (through urine) and impairs your ability to rehydrate.

Snack wisely

- Snacks can provide additional nutrients between meals and extra energy on training days.
- They can also be a source of unhealthy nutrients and calories that you simply don't need
- Try to choose fresh, unprocessed snack options consisting of whole foods.
- The best way to stop eating unhealthy snacks - don't have them in the house. Don't buy them from the supermarket even for the kids (they're bad for the kids too!).

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Quick, healthy snack ideas

- Cheese/tuna/avocado/tomato/peanut butter on crackers or bread
- A sandwich
- Yoghurt
- Fruit (fresh or dried)
- Nuts and seeds
- Low sugar muesli bar
- Baked beans and cheese
- Hummus with veggie sticks (e.g. edamame beans/carrots/celery)
- A boiled egg
- Sushi
- Jerky
- Smoothie
- Popcorn
- A bowl of cereal with milk and fruit

Exercise specific nutrition

When people think 'sports nutrition' they are generally thinking of exercise specific nutrition - what you eat during the exercise itself. Don't make the mistake of thinking this only applies to event day, getting your nutrition right during training is essential if you want to perform at your peak on your big day.

Nutrition for training

Optimising nutrition during training will:

- Improve quality and intensity of your training sessions resulting in increased fitness gains.
- 'Train your gut' to tolerate greater amounts of fuel allowing you to consume more energy on race day and therefore operate at a higher intensity for longer.
- Allow you to trial your race day plan, tweak it so it is perfect, and reduce the chances of stomach upset on race day.

Fuel

Just like a Formula 1 car, the body requires fuel, and enough so that it does not run out during a session. Consider carbohydrates as petrol, the predominant fuel when endurance training. Muscles need a steady and reliable supply. Many scientific studies have shown that the more carbohydrates you ingest during endurance activity, the better you will perform.

More is better. The more carbs you ingest, the more carbs are available for your exercising muscles, thus delaying fatigue and allowing you to exercise harder, and get bigger fitness gains.

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Nutrition during training is important to not only increase the quality of that training session, but also to increase your tolerance to taking on board carbohydrates during exercise.

Your gut needs to be trained to absorb carbohydrates.

Consuming carbohydrates during training will increase your ability to absorb carbohydrates during exercise, so come event day, you will be able tolerate a larger amount of carbohydrates per hour and therefore provide more fuel to your muscles. The more you practise the less chance of gastrointestinal discomfort on event day as well.

Finally, the actual process of getting the carbs from your pocket to your mouth needs practise as well. You must find a system which you can use easily. Do you prefer squeeze tubes or plastic 'rip-open' sachets? Can you peel and eat a banana whilst riding in a bunch? These things need to be practised during training not tried for the first time on event day.

How much?

Each individual requires different amounts of fuel depending on personal and environmental factors, their session goals, and how they are building towards race day. Some general guidelines are:

- Use carbohydrates (fat and protein do not improve performance if taken during exercise)
- Start at about 30g per hour and look to increase to 75g/hr on event day
- Consuming carbohydrates will not benefit performance during exercise that lasts less than 60 minutes, but you may choose to take some if you feel flat, want to practise using carbohydrates, or it is a particularly intense session.
- Skipping/delaying carbohydrate intake in some (less intense) sessions will force your body to improve its fat burning capabilities (a good thing), but do this less often than fuelling optimally.

Fluid

Fluid is also important, just like a car engine doesn't want to over heat, the body slows down as internal body temperature increases as a result of exercise. Fluid is lost (as sweat) in the process of keeping us cool, so it must be replaced during exercise. If you not replace enough fluid your training will be compromised, however replace too much and you risk hyponatraemia. At Trailblazer we recommend that you drink at least 600mls of fluid per hour of exercise when your exercise duration is greater than 2 hours. On hot, humid, and windy days, you will need to drink more to this as you will sweat more.

You can measure your sweat rate (talk to Tom about how to do this), and aim to replace this on longer training sessions and on race day.

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Electrolytes

Much has been made of the value of salt over the years. We lose salt when we sweat, and it has become ingrained in endurance athletes' thinking that it is necessary to replace this salt during exercise. New research indicates that salts' role may have been overhyped. However, rightly or wrongly, salt is added to our sports drinks and gels (and is present in most food) in sufficient quantity, so it is not something that you need to think about.

Event day

Event day nutrition is simply an extension of what you have been doing during training, and is the subject of Trailblazer Nutrition's Golden Rule: *never do something on event day that you haven't trialled in training.*

Great British Olympic marathoner Liz Yelling said her most important piece of race day advice was "when you stand on that start line you must know your nutrition and hydration strategy.... It's very personal so you must have practised it in training."

When designing your event nutrition plan you must consider the different situation that an event presents compared to training. It is likely you will go further on event day than you have done in training, will you be able to carry enough fuel? How will you carry it? Will you use the aid stations? The last thing you want to do is to lose your rhythm/peloton/hit the wall because you have not planned your nutrition properly.

Practical tips

- Sports drinks are a great way to meet fluid requirements whilst also contributing some carbohydrates, but they are unlikely to meet your carb needs entirely.
- Gels and sports bars are specifically designed to be well tolerated during exercise, but bananas, sandwiches, rice cakes, flap jacks, pre cooked potatoes, lollies, and muesli bars can work if preferred.
- If you are not using gels, I would not recommend meeting your carbohydrate requirements from a single source of whole food (e.g. only bananas). Have a range of carbs from the list above.
- You must consider how your gels and hydration plan combine, how much carbs this gives you, and whether or not this is too much or too little.

Recovery

You do not get fitter during training itself. You get fitter during recovery. Training creates the potential for physical adaptation (and therefore fitness gains), but it is during recovery where this potential is fulfilled.

This tells us recovery nutrition is of utmost importance. If you don't provide your body with the right amount, of the right nutrients, at the right times during the recovery period, you won't achieve your adaptation potential, and your hard work in training will be wasted. In fact you shouldn't consider your training session over until you have had a recovery meal (or two).

What nutrients?

Protein is needed to rebuild your damaged muscles, and carbohydrates are required to replace the fuel that you burnt during exercise. Good foods to incorporate into a recovery meal are:

Carbohydrates	Protein
Bread	Eggs
Breakfast cereals, oats, beans	Meat, fish, chicken
Potato, kumara, yam, parsnip	Nuts and seeds
Pasta	Dairy - milk, yoghurt, cheese
Rice, couscous, quinoa	Lentils, tofu

How much?

This varies from person to person, depends on the duration of your training session, and the goals of your training session. As a general guide, snack soon after exercise and then follow this up with a larger meal.

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On light training days you might just have one snack (after exercise), medium training days you may have a snack after exercise and 1-2 additional snacks, and on a heavy training day you should aim to have a snack after exercise followed by a decent meal, and 2-3 other snacks over the day.

When?

I touched on this above, but the important thing to realise is that recovery nutrition is not just the 1-2 hours after exercise, but is the following 24 hours. The first couple of hours is a great time to eat because your body does tend to absorb and utilise the nutrients very efficiently during this time, but focusing only on this window can take emphasis away from meals later in the day.

Many people tend to gain weight during heavy training periods. With unstructured and unplanned eating habits they tend to cram in nutrition sporadically, which often leads to overeating and weight gain. I see this a lot with people who do not eat enough (or try to restrict eating) after exercise, and then binge later in the day on sugary junk when the cravings hit.

When you plan your exercise, also plan your post exercise nutrition. Make sure that you have an appropriate amount and type of food waiting for you at the end, whether it is keeping snacks at work, or making sure you have the right foods at home.

Summary

Endurance nutrition is important during training, not just on race day

- Ensure a high quality everyday diet – follow the plate model and snack wisely
- Carbohydrates are the weapon of choice during training, top up with sports drink, gels, or whole foods
- A [personalized plan](#) will ensure the right amounts of carbs, fluids, and electrolytes to train hard and avoid gastro problems
- Race day nutrition is an extension of training, don't try anything on race day you haven't trialled in training.
- Practising your nutrition plan will mean that you can line up on event day confident that your nutrition plan is right for you.
- Recovery is where the magic happens, consuming the right amount of carbs, protein and fluid after training will allow all the hard work you put in during the session to be converted to fitness improvements.

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- You don't need to follow your plan obsessively everyday, but having a healthy diet, fuelling yourself well during training, and focusing on recovery will improve fitness gains and help you enjoy your race day experience.